

All nuisance blue-green algal taxa, including Microcystis, Anabaena and Aphanizomenon, have the ability to become buoyant during stagnant periods when the water column is vertically stratified (either due to thermal or salinity stratification). Buoyancy is a response which, from an ecological standpoint, greatly favors the growth of blue-green taxa over more desirable (non-buoyant) algal groups, such as diatoms, green algae and flagellates. During stratified periods blue-green algae can float to the surface, thereby capturing optimal amounts of sunlight for photosynthetic production and net growth, while shading underlying algae.

It is not presently known whether such stratification potentials exist, and, if so, what their duration and seasonality are.

#### 7.1.1.6 Suspended Solids and Sedimentation

Because the peninsula has very little relief, erosion is not a significant problem. Development of peatlands causes a slight increase in sediment loads in drainage waters, particularly during land clearing, buried wood removal and field shaping. Thus, disturbance caused by peat mining may be expected to increase sediment loads in drainage canals unless settling ponds or other measures to remove suspended sediment from drainage waters are utilized. Once initial development activities are completed, erosion and turbidity during normal agricultural production are not likely to cause water quality problems (Skaggs et al., 1980).

The normal hydrology of North Carolina estuaries causes them to function as sediment and nutrient traps. Increasing salinity down the estuary neutralizes the electrical charges on colloidal organic and clay particles, resulting in flocculation and sedimentation. The sediments are usually soft, organic-rich muds which constitute a huge sink for oxygen in the overlying water. Most of the sediment is mineral matter, silts and clays from the Piedmont as well as from local areas of the Coastal Plain. The remainder is organic matter, some relatively resistant material of terrestrial origin and some more labile material originating from phytoplankton (Matson et al., 1983). Microbial activity in the sediments and chemical transformations release ammonium and phosphate to the bottom water, some of which moves upstream, thus recycling the nutrients to the phytoplankton and resulting in high levels of productivity (Stanley and Hobbie, 1977; Kuenzler et al., 1979; Kuenzler et al., 1982; Paerl, 1982, 1983). High levels of summertime production which occur in the middle reaches of Pamlico River (Kuenzler et al., 1979) have not been considered noxious. Similar or higher productivities in fresher parts of the Chowan and Neuse Rivers, however, have included blooms of blue-green algae which are not only noxious but may also adversely affect